Environmental Information for Decision Making

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Decision makers need to be able to obtain and use reliable information both before and during their responses to environmental problems. For example, prioritization of risk management decisions involves balancing many different factors on a regional basis. On the other hand, remedial actions need monitoring and data analysis to evaluate the continuing effectiveness of the remediation. These two talks approach the questions of environmental information from the perspective of the regional decision maker and the site-specific decision maker (see attachments).

Attachment A
ReVA's Environmental Decision Toolkit: A Web-based Data and Information Source

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Decision makers need information on cumulative and aggregate stressors as well as clear information on where problems are likely to occur in the future in order to prioritize risk management actions. The changes that are most pervasive and difficult to assess are the result of regional-scale drivers of change that act simultaneously on a suite of resources that are important to society and to ecological sustainability. A great deal of data already exist that could potentially inform risk management decisions; however, there has been no effort previously to synthesize these data into meaningful assessment results that can inform the multiple criteria that go into any kind of decision making. Methods to do this are critical to timely, responsive, and proactive decision making.

Prioritization of risk management actions involves balancing many different factors that can be addressed through a series of assessment questions, such as:

- What is the overall environmental condition of the region?
- What is the relative condition of locations within a region?
- Where are the most vulnerable (i.e., both high stressor levels and high numbers of resources) locations in a region?
- How will conditions and vulnerabilities change in the future?
- How applicable are risk management options to other locations in the region?

This presentation will describe and demonstrate a Web-based Environmental Decision Toolkit that can be used by decision makers to prioritize risk management actions and target the use of limited resources. This tool, developed by EPA's Regional Vulnerability Assessment (ReVA) Program, makes use of existing data and model results to address a suite of assessment questions as part of multi-criteria decision making. The tool is designed to be portable and can be used for assessments at any scale, ranging from national down to local/community.

Attachment B
Design Installation and Results of an Autonomous Monitoring System at the Gilt Edge Mine Superfund Site, South Dakota

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Remediation of acid-generating mine waste-rock dumps is a significant problem, both in the U.S. and globally. The conventional approach to minimizing acid production is to reduce or eliminate oxygen loading and water flow through the rock materials-by utilizing a capping system. Ensuring cap integrity and understanding the performance dynamics of the capped system requires detailed monitoring information over the lifetime of the capping system. In conjunction with wells to sample/analyze water and pore gas, an autonomous monitoring system—consisting of a multi-electrode electrical resistivity system, plus temperature, tensiometer, and flow sensors—was integrated in the repository below the geo-membrane cap at the Ruby Ridge Repository at the Gilt Edge Mine Superfund site. Data from this system are automatically entered into a relational database, processed, and visualized. Users can access information on the system using a standard Web browser, set alarms on specific conditions, and request on-demand or automated reports. Information is provided at levels appropriate for operational, regulatory, and scientific purposes. Since the system was started in the summer of 2003, it has provided cost- effective, near real-time information into both the boundary conditions of the dump and the behavior of the dump to a broad spectrum of users, and it is expected that this system could be a template for similar monitoring systems across the country.